THE M-O VALVE
COMPANY LIMITED

KT66



BEAM TETRODE

BRIEF DATA

A beam tetrode with an absolute maximum anode dissipation rating of 30 W. It is designed for use in the output stage of an a.f. amplifier, or as a series valve in a stabilized power supply.
The KT66 is a commercial version of the CV1075.

HEATER

Heater voltage	6.3	V
Heater current (approx)	1.3	A

MAXIMUM RATINGS

	Design Max	Absolute Max	
DC anode voltage	500	550	V
DC screen voltage	500	550	V
Negative dc grid voltage	200	200	V
DC cathode current	200	200	mA
Anode dissipation	25	30	W
Screen dissipation	3.5	4.5	W
*Anode and screen dissipation	27	32	W
Heater-cathode voltage	150	150	V
Bulb temperature	250	250	°C
External grid-cathode resistor (cathode bias):			
$p_{a+g2} \leqslant 27$ W	1.0		MΩ
$p_{a+g2} > 27$ W	500		kΩ
External grid-cathode resistor (fixed bias):			
$p_{a+g2} \leqslant 27$ W	250		kΩ
$p_{a+g2} > 27$ W	100		kΩ

*Triode or ultra linear operation.

CAPACITANCES (Measured on a cold unscreened valve)

Grid to all less anode	14.5	pF
Anode to all less grid	10.0	pF
Anode to grid	1.1	pF

CHARACTERISTICS

Tetrode Connection

DC anode voltage	250	V
DC screen voltage	250	V
Negative dc grid voltage	15	V
Mutual conductance	7	mA/V
Internal anode resistance	22.5	kΩ

Triode Connection

DC anode voltage	250	V
Negative dc grid voltage	15	V
Mutual conductance	7.3	mA/V
Internal anode resistance	1.3	kΩ

TYPICAL OPERATION

Triode Connection. Class A. Single Valve. Cathode Bias.

V_b	270	440	V
$V_{a,g2}$	250	400	V
$-V_{g1}$ (approx)	20	38	V
$v_{in(pk)}$	20	38	V
R_k	330	600	Ω
$I_{a+g2(o)}$	60	63	mA
$p_{a+g2(o)}$	15	25	W
R_L	2.75	4.5	kΩ
P_{out}	2.2	5.8	W
D_{tot}	6	7	%

Triode Connection. Class AB1. Push-Pull. Cathode Bias.

V_b	270	440	V
$V_{a,g2}$	250	400	V
$-V_{g1}$ (approx)	19	38	V
$v_{in(g1-g1)(pk)}$	38	76	V
*R_k	2 x 345	2 x 615	Ω
$I_{a+g2(o)}$	2 x 55	2 x 62	mA
$p_{a+g2(o)}$	2 x 14	2 x 25	W
$R_{L(a-a)}$	2.5	4.0	kΩ
P_{out}	4.5	14.5	W
D_{tot}	2.0	3.5	%
†IM	3.0	3.0	%
z_{out}	3.5	3.5	kΩ

*It is essential to use two separate cathode bias resistors.
†Intermodulation distortion : measured using two input signals at 50 and 6000 Hz (ratio of amplitudes 4:1)

Tetrode Connection. Class AB1. Push-Pull. Cathode Bias

$V_{b(a)(o)}$	450	V
$V_{b(a)(max\ sig)}$	425	V
$V_{a(o)}$	415	V
$V_{a(max\ sig)}$	390	V
$V_{g2(o)}$	300	V
$V_{g2(max\ sig)}$	275	V
$-V_{g1}$ (approx)	27	V
$I_{a(o)}$	2 x 52	mA
$I_{a(max\ sig)}$	2 x 62	mA
$I_{g2(o)}$	2 x 2.5	mA
$I_{g2(max\ sig)}$	2 x 9	mA
$p_{a(o)}$	2 x 21	W
$p_{a(max\ sig)}$	2 x 9	W
$p_{g2(o)}$	2 x 0.75	W
$p_{g2(max\ sig)}$	2 x 2.5	W
* R_k	2 x 500	Ω
$R_{L(a-a)}$	8	kΩ
$V_{in(g1-g1)(pk)}$	70	V
P_{out}	30	W
D_{tot}	6	%

*It is essential to use two separate cathode bias resistors.

Ultra-linear Connection. Push-Pull. 40% Taps. Class AB1. Cathode Bias.

V_b	450	V
$V_{a,g2(o)}$	425	V
$V_{a,g2(max\ sig)}$	400	V
$I_{a+g2(o)}$	2 x 62.5	mA
$I_{a+g2(max\ sig)}$	2 x 72.5	mA
$p_{a+g2(o)}$	2 x 26.5	W
$p_{a+g2(max\ sig)}$	2 x 13	W
* R_k	2 x 560	Ω
$-V_{g1}$ (approx)	35	V
P_{out}	32	W
$R_{L(a-a)}$	7	kΩ
z_{out}	9	kΩ
D_{tot}	2	%
†IM	4	%

*It is essential to use two separate cathode bias resistors.
†Intermodulation distortion : measured using two input signals at 50 and 6000 Hz (ratio of amplitudes 4:1).

Ultra-linear Connection. Class AB1. Push-Pull. 40% Taps. Fixed Bias.

$V_{a,g2(o)}$	525	V
$V_{a,g2(max\ sig)}$	500	V
$I_{a+g2(o)}$	2 x 35	mA
$I_{a+g2(max\ sig)}$	2 x 80	mA
$p_{a+g2(o)}$	2 x 18	W
$p_{a+g2(max\ sig)}$	2 x 15	W
*$-V_{g1}$ (approx)	67	V
$R_{L\,(a-a)}$	8	kΩ
$V_{in(g1-g1)\,(pk)}$	127	V
P_{out}	50	W
D_{tot}	3	%
†IM	15	%
Z_{out}	10	kΩ

*A negative bias range of ±25% of this value should be available for each valve.

†Intermodulation distortion : measured using two input signals at 50 and 6000 Hz (ratio of amplitudes 4:1)

LIFE PERFORMANCE

The average life expectancy of the KT66 when operated at absolute maximum ratings (see page 1) is at least 8000 hours. At a reduced rating of $p_{a\,+\,g2}$ = 21 W a life of at least 10,000 hours should be obtained. The environment must be a static one and the valve should be switched not more than 12 times in each 24 hours.

A valve is considered to have reached the end of life when it is either inoperative or one or more of its characteristics have reached the following values:

P_{out}	50% of initial value	
*g_m	<5.5	mA/V
*Measured at:		
V_a	250	V
V_{g2}	250	V
I_a	85	mA

INSTALLATION

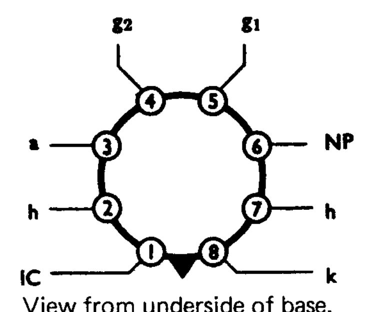
The valve may be mounted in any position but when horizontal it should be orientated as shown in Fig.1. No retaining device or external screening is normally necessary.

Adequate ventilation should be provided. A pair of valves working at maximum ratings should be mounted at not less than 9 cm (3.5 in.) between centres.

For the prevention of parasitic oscillation, a series resistor of 100–300 Ω should be connected close to the screen tag of the valve socket. When the

valve is triode connected, this resistor should be connected between screen and anode. A control grid series resistor of 10–50 kΩ is also recommended. In push-pull applications having a large change in anode current between the quiescent and full output conditions, an inductance input filter circuit of good regulation should be used. A badly regulated supply will cause a fall in power output and/or excessive quiescent anode dissipation.

BASE CONNECTIONS AND VALVE DIMENSIONS



View from underside of base.

Base :	International Octal (B8–0)
Bulb :	Dome top tubular
Max. overall length :	135 mm
Max. seated length :	121 mm
Max. diameter :	53 mm

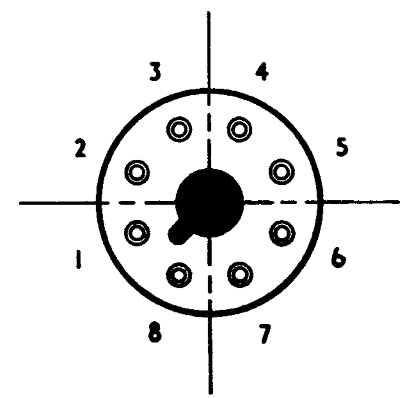
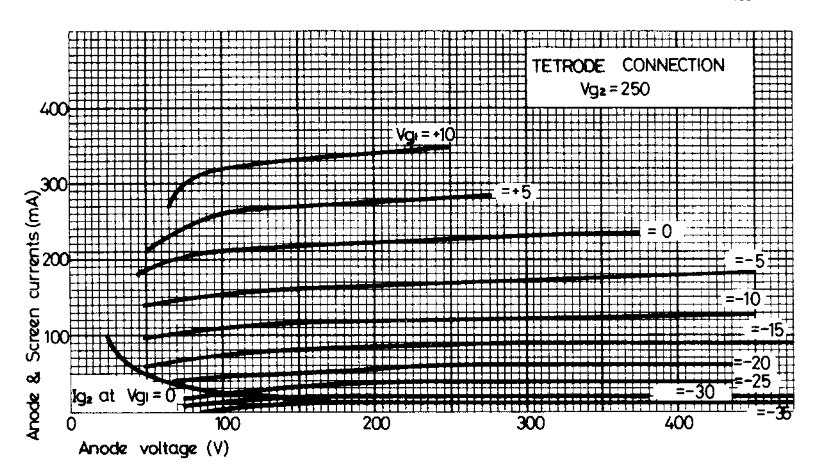
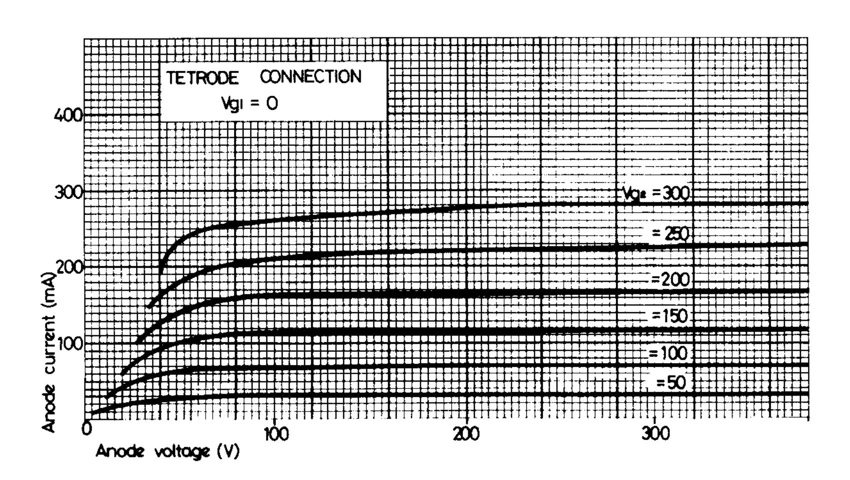
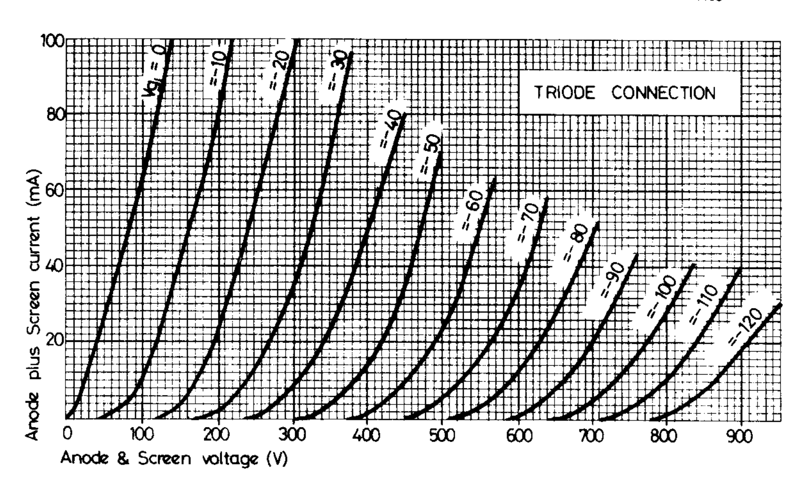
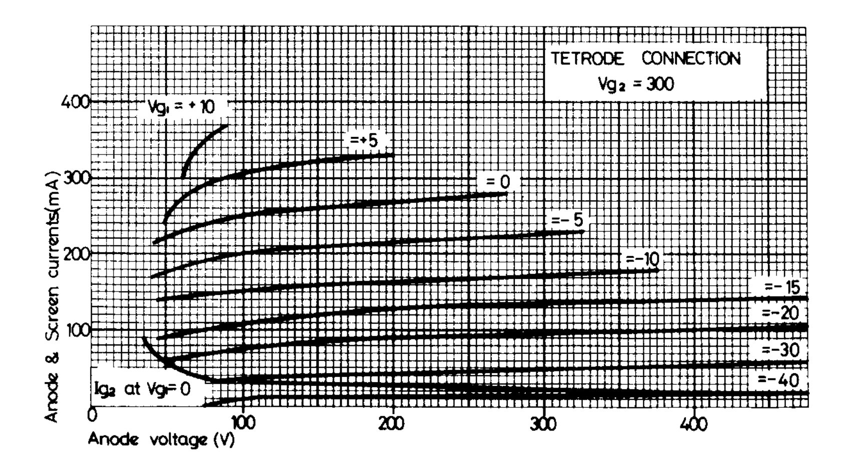


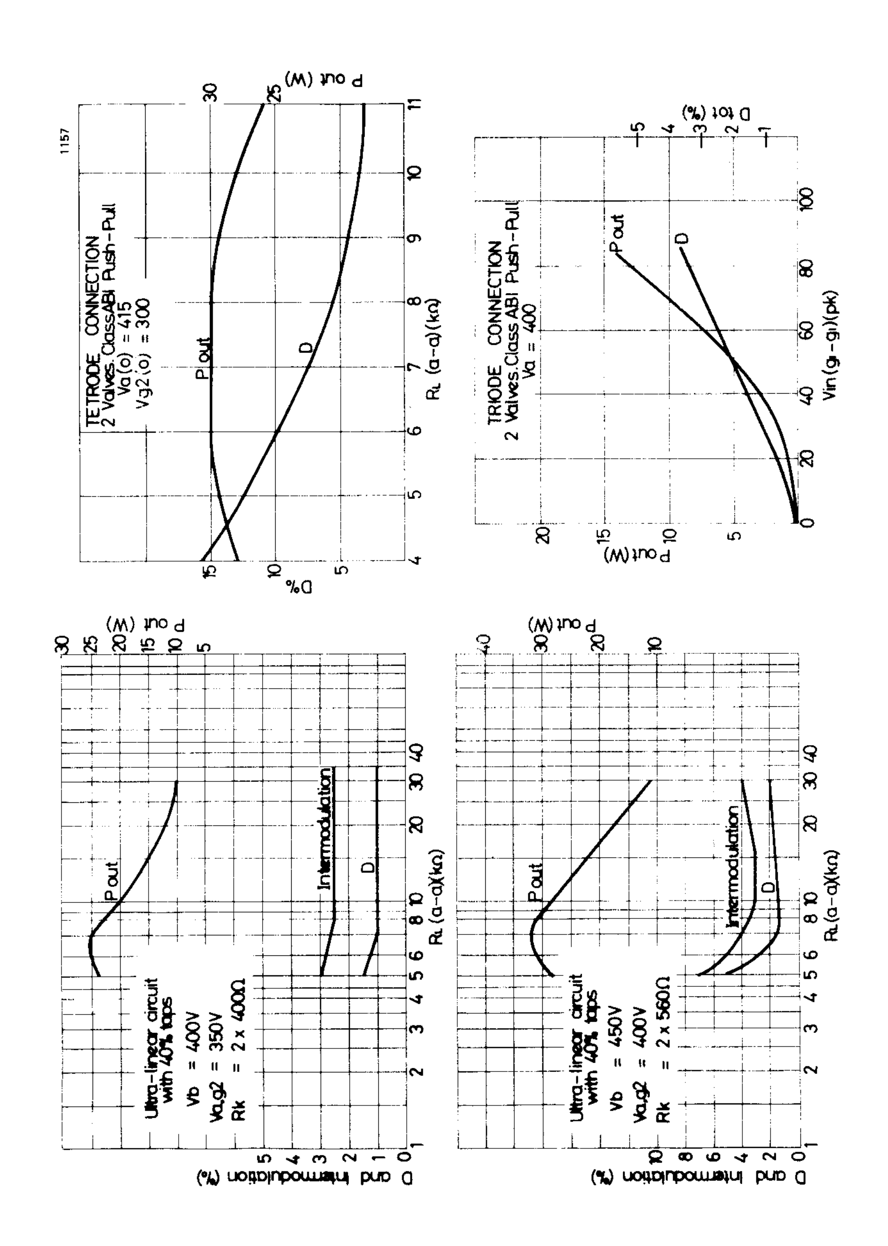
Fig. 1.
Correct orientation of the valve socket for horizontally mounting the KT66.


TETRODE CONNECTION
Vg2 = 250
Vg1 = +10
= +5
= 0
= -5
= -10
= -15
= -20
= -25
= -30
= -35
Ig2 at Vg1 = 0
Anode & Screen currents (mA)
400
300
200
100
0
100
200
300
400
Anode voltage (V)


TETRODE CONNECTION
Vg1 = 0
Vg2 = 300
= 250
= 200
= 150
= 100
= 50
Anode current (mA)
400
300
200
100
0
100
200
300
Anode voltage (V)


TRIODE CONNECTION
Vg1 = 0
=-10
=-20
=-30
=-40
=-50
=-60
=-70
=-80
=-90
=-100
=-110
=-120
Anode plus Screen current (mA)
Anode & Screen voltage (V)


TETRODE CONNECTION
Vg2 = 300
Vg1 = +10
=+5
=0
=-5
=-10
=-15
=-20
=-30
=-40
Ig2 at Vg1 = 0
Anode & Screen currents (mA)
Anode voltage (V)


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TETRODE CONNECTION
2 Valves. Class ABI Push-Pull
Va(o) = 415
Vg2(o) = 300
P out
D
D%
P out (W)
RL (a-a)(kΩ)
TRIODE CONNECTION
2 Valves. Class ABI Push-Pull
Va = 400
P out (W)
D tot (%)
Vin(g-g)(pk)
Ultra-linear circuit
with 40% taps
Vb = 400V
Va,g2 = 350V
Rk = 2 x 400Ω
Intermodulation
D and Intermodulation (%)
RL (a-a)(kΩ)
Ultra-linear circuit
with 40% taps
Vb = 450V
Va,g2 = 400V
Rk = 2 x 560Ω